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RADIUM

EDITED BY
CHARLES H. VIOL, Ph. D.
AND
WILLIAM H. CAMERON, M. D.

VOL. XII MARCH, 1919 No. 6

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A MONTHLY JOURNAL DEVOTED TO THE CHEMISTRY PHYSICS AND THERAPEUTICS OF RADIUM AND RADIO-ACTIVE SUBSTANCES

RADIUM

A MONTHLY JOURNAL DEVOTED TO THE CHEMISTRY, PHYSICS AND THERAPEUTICS OF RADIUM AND RADIO-ACTIVE SUBSTANCES

Edited and Published by Charles H. Viol, Ph. D., and William H. Cameron, M. D. with the assistance of collaborators working in the fields of Radiochemistry, Radioactivity and Radiumtherapy.

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VOL. XII MARCH, 1919 No. 6

RADIUMTHERAPY IN HYPERTHYROIDISM WITH OBSERVATIONS ON THE ENDOCRINOUS SYSTEM*

By William H. B. Aikins, M.D., C.M., Toronto.

Part I.

During recent years the increasing use of radiumtherapy in the treatment of pathological conditions of the thyroid gland has given the writer an opportunity to make certain interesting observations on the thyroid itself, and also on its relationship towards other members of the endocrinous system.

The use of radium has been directed more particularly towards pathological increases of function than towards simple enlargement of the gland. The extension of radiumtherapy into this field was first brought about by Dr. Robert Abbe, of New York, in 1905, who, by burying radium tubes in the gland itself, in a case of exophthalmic goitre, caused shrinking of the mass and cessation of the symptoms of thyroidism.

Tentatively the writer has treated one or two cases of hyperthyroidism some seven or eight years ago with clinical improvement. The permanence of the result obtained in these patients justified one in advocating radiumtherapy for such functional disturbances of the thyroid. In all, 45 cases have been under treatment, the majority during the past three years. Of these 23 have been clinically cured—that is, the tachycardia, tremor, and restlessness have disappeared, and symptoms of excessive thyroid secretion have abated. In 17 cases there has been an improvement, but not a complete cessation of symptoms. Four cases have passed observation. In only 19 patients did the thyroid gland itself decrease in

*Read at the meeting of the American Radium Society, Chicago, June 16, 1918.

size, as evidenced by neck measurement, while in six there was no diminution in the size of the gland, although the nervous symptoms were completely relieved. In three cases thyroidectomy had been performed, but the nervous symptoms had not diminished. This was, however, effected by radiumtherapy.

In connection with the treatment of these cases, it must not be overlooked that general medical measures were carried out as well. In some cases complete bodily and mental rest, in others partial, was established. A low protein diet and one poor in extractives was devised, while the internal administration of quinine hydrobromate grs. 5 t.i.d., together with ergotin gr. 1, t.i.d., was prescribed. In a large number of these cases all these usual medical measures had failed to relieve the symptoms, and it was only when radiumtherapy was added as a therapeutic measure that the hyperthyroidism was lessened.

It is to be noted also that it was only in a percentage of cases that there was decrease in the size of the gland. Surgical measures would be necessary in many to effect this, and yet the nervous condition was such that surgery was a very risky procedure. The relief of the nervous symptoms made it possible to undertake the surgical removal of the goitre for cosmetic reasons later on if the patient wished it.

The occurrence of exophthalmic goitre following the removal of the ovaries in two of three cases under observation interested the writer in the inter-relationship existing among the organs of internal secretion. These cases may be cited in detail.

Illustrative Cases.—Blair Bell reports two cases which are extremely interesting from the point of view of the subject we have under consideration. In one of them, a woman of 46, double oophorectomy was done for malignant disease. For the first two months after the operation the patient did well, but then the symptoms of exophthalmic goitre developed, and she died from it within a year of the operation. The second case was that of a woman of 25, who had been perfectly well until the birth of her first child, eleven months before she came under observation. Menstruation did not recur, and all the typical symptoms of exophthalmic goitre developed. In this case the uterus was found to be in a state of super involution, its length being less than two inches. The pathology of super-involution is still somewhat obscure. He thinks it probable that deficiency of ovarian secretion may play a part in some cases, but that at the same time secretory disturbances of the other ductless glands may lead to a similar condition. The following are details of two cases which have come under my observation:

Case 1.—Mrs. K., 35 years of age, who was referred to me in February, 1914, by Dr. Smith, of North Bay. In May, 1913, double oophorectomy was done for a chronic inflammatory condition. In the following November symptoms of hyperthyroidism appeared, gradually increasing in severity. She was treated by prolonged rest, the internal administration of quinine hydrobromate, and all the usual medical measures. When I first saw her in February, 1914, there was only slight enlargement of the thyroid, but the pulse rate was 140, and there was marked nervousness and tremor. The treatment was then supplemented by irradiation of the area of the thyroid gland by means of screened plaques of radium. Two weeks later the pulse rate had gone down to 75, nervousness and tremor were less marked, and she was resting well. Further radium treatment was given a month later. There was constant improvement in the symptoms, and she gradually became able to take

more exercise and to do light work without distress. She has now resumed her normal life, and has been quite well ever since.

CASE 2.—Mrs. W. This lady had a panhysterectomy performed in August, 1915, for carcinoma of the uterus. A year later she manifested symptoms of hyperthyroidism. She became very nervous and excitable, the thyroid increased in size, the eyes became prominent, and the patient was very much emaciated. The pulse was very erratic, going up to 140 on the slightest exertion. Rest, together with the administration of bromides, and quinine hydrobromate, the constant application of an ice bag over the heart, and the radiation of the thyroid gland at intervals, have resulted in most marked and gratifying improvement. The pulse has become steady and quiet, the nervousness, tremor, and exophthalmos almost completely disappeared, while she has gained in weight, and is now able to perform her ordinary duties.

In the Report of the Manchester and District Radium Institute Dr. Burrows reports seven cases of exophthalmic goitre, all of which are improved by radium. In a subsequent report, published in May, 1917, he says that of a total number of 40 cases 21 were considerably improved, but that in most of these cases sufficient time had not elapsed to estimate the permanent results.

Drs. Gaston Torrance, Gewin and Weed, of Birmingham, Alabama, report a case in which tachycardia rapidly subsided, the thyroid diminished in size, and nervousness disappeared. Dr. Lee, of Rochester, also reports a successful case, and says that, although exophthalmic goitre, with involvement of the thymus, does not respond to radium so well as to operation, radium brings about great improvement.

Dr. Dawson Turner reports the case of a woman at 69, who has suffered for two years from severe exophthalmic goitre with tachycardia up to and above 170. After other measures, including the x-rays, had been tried in vain, radium brought about rapid improvement, which was maintained.

The idea of a certain functional correlation and inter-relationship between different organs and different parts of the body is not by any means new, but within the last two or three decades this theory has undergone a considerable amount of development, more especially in regard to the relationship which exists between those organs which are known as the ductless glands or the organs of internal secretion. In spite of the fact that recent investigations, both experimental and clinical, particularly those of Biedl and Blair Bell, have added considerably to our knowledge in this respect, the exact character of this relationship still remains more or less obscure.

Internal secretions were first described by Brown-Sequard at a meeting of the Societe de Biologie at Paris in 1889, who showed experimentally that, in addition to nervous intercommunication between the different organs of the body, a process of internal secretion, in the nature of a chemical interchange between certain organs, is constantly going on. This theory has since been elaborated by several writers, including Bayliss and Starling, Biedl and Blair Bell.

To the ductless glands or organs of internal secretion, which are generally assumed to include the thyroid, thymus, pituitary gland or hypophysis cerebri, the suprarenals, the pineal gland and ovaries, Schafer has given the name of the endocrinous glandular system. He describes an endocrinous gland as one which is known to form within its cells some specific chemical substance which is passed directly or indirectly

into the blood stream, thus forming the active material of its secretion, in the same way that ptyalin is the active agent of the salivary gland. The endocrinous glands differ from the salivary glands, however, in that their secretion remains within the body, circulating with the blood, whereas that of the salivary glands passes by way of a duct to the exterior of the body, and is excreted.

The results of the investigations of Biedl and Blair Bell indicate that the individual members of this glandular system are very intimately connected with one another, and that this relationship is dependent on a chemical interchange of their specific secretions, which is accomplished by the intermediation of the blood stream. They indicate further that this interdependence tends to keep the body as a whole in a condition of equilibrium. It is, therefore, reasonable to suppose that the removal of any one of these organs, or the cessation of its secretion, would be likely to have a more or less deleterious effect upon the others, and tend to upset the equilibrium of the body generally. Blair Bell's observations conclusively prove that this supposition is founded on fact.

Hormones.—Biedl assumes that the chemical correlation is brought about by means of the active principles of the secretions, which serve as intermediaries between the different organs. Sir Edwin Schafer states that the results of his research indicate that the action of the active principles of the internal secretions is not unlike that of the active principles of drugs, which also operate by direct action on the parts to which they are conveyed by the circulating blood.

The active principles of the endoctrinous glands also resemble drugs, in that extracts of some of them tend to stimulate or excite the cellular functions, while others depress or inhibit them. An example of the latter effect is that of injection of extract of placenta, which tends to inhibit the secretion of milk.

The term *hormone,* which is derived from a Greek word meaning to excite or stimulate, was originally applied by Bayliss and Starling to stimulating active principles, such as that contained in extract of duodenum after treatment by acid, and its significance has since been extended to include the active principles of all internal secretions. Biedl and Schafer point out, however, that there are two different groups of hormones. Biedl describes these two groups as assimilatory and disassimilatory, the first group conducing to the building up of living tissue, while the second favors its decomposition. Schafer describes them as stimulating principles and depressing or inhibiting principles, in that, while some of them stimulate function, others depress or inhibit it Schafer emphasizes the advisability of discriminating between these two groups of active principles, and limiting the term *hormone* to those which have a stimulating action. For the depressing or inhibiting agents he suggests the use of the Grek word *chalone,* which is derived from a Greek word meaning to make slack. He defines a chalone as an endocrinous secretion, tending to inhibit or prevent activity of an organ or tissue, and a *hormone,* on the other hand, as a secretion which excites or stimulates an organ or tissue to increased activity. Biedl is of the opinion that the increased functional activity of organs of internal secretion, which may follow the suppression of any one secretion, is to be regarded as a symptom of the disassimilation due to this suppression.

Frequency of Goitre in Women.—The much greater frequency of exophthalmic and other forms of goitre in women, as shown by a remarkable unanimity in the statistics to this effect, definitely indicates the close connection which exists between the thyroid and the genital organs, and

the influence of ovarian secretion on the thyroid. This intimate relationship is also obvious from the fact that the manifestations of exophthalmic goitre frequently make their appearance or are aggravated at critical periods in development, such as puberty, during menstruation, and at and after the menopause.

As regards comparative frequency in the sexes, the returns of the Registrar-General show that during the four years (1911 to 1914) there were in England and Wales 1,613 deaths from exophthalmic goitre, 1,558 of them being women and 155 men, or a proportion of no less than ten to one. Hector Mackenzie has collected 438 cases, 393 being women and 45 men, a proportion of nine to one. In six of his cases the condition followed a prolonged and difficult confinement. Dr. Helen Gurney has made an analysis of 93 cases of exophthalmic goitre, 92.5 per cent. of which were in women. Von Graefe states that his cases were six to one, Trousseau that his were fifty to eight, Henoch that his were twenty-three to four, and Praele that his were twenty-one to one. Mr. James Berry, who has had considerable experience in the treatment of exophthalmic goitre, states that in his experience goitre was eight times as common in women as in men. Of 103 cases which he operated upon during 1913 eleven only were in men. In this connection Mr. Berry makes a rather interesting statement. He says that his patients with exophthalmic goitre are very seldom women who have married at an early age and had children. They are, as a rule, either unmarried women, widows, or women who are separated from their husbands, or women who are, in some way or other, not leading a normal sexual life.

Influence of the Thyroid Gland on Menstruation and Puberty.—The secretion of the thyroid may be either insufficient or excessive. If it is insufficient puberty may be delayed, or may be followed by secondary amenorrhea or scanty menstruation associated with dysmenorrhea. Blair Bell's researches indicate that if thyroid secretion is deficient menstruation is either scanty or absent altogether. The influence of thyroid insufficiency in this connection is shown by the fact that such cases are usually cured by the administration of thyroid extract. Many writers, including Biedl and Blair Bell, state that swelling of the thyroid is very common during the menstrual periods. Biedl is of the opinion that, though it may be partly due to the general vascular changes which are associated with menstruation, there is no doubt whatever that a general biological relationship exists between the thyroid gland and the ovaries.

Blair Bell, on the other hand, points out that excessive thyroid secretion may act in one of two ways, namely: (1) It may stimulate the genital functions to excessive activity, or (2) it may upset general metabolism to such an extent as to cause them to cease altogether. He says that there is a form of hyperthyroidism which results in excessive menstruation, and which is not associated with any of the ordinary symptoms of exophthalmic goitre. In his experience this excessive functional activity is not infrequently accompanied by menorrhagia. Blair Bell suggests the possibility that this excessive functional activity may possibly be due to incomplete development of the ovaries.

As regards the use of the term *hyperthyroidism* to describe Graves' disease, there seems to be some difference of opinion as to whether this is a very suitable description of it. Berry says that he does not go so far as to say that Graves' disease is due to thyroid insufficiency, but he considers that such a statement would be quite as accurate as to say that it is due solely to excess of thyroid secretion. In his opinion the idea that it is due to hyperthyroidism has arisen from the fact that the

symptoms of excess are so very conspicuous that they completely overshadow the concomitant signs of thyroid insufficiency. Oswald also thinks that goitre, including Graves' disease, should not be regarded as a manifestation of increased thyroid activity, but rather as an indication that the secretion has lost its physiological value and become perverted.

Murray Leslie, in a series of cases, has observed the effects on menstruation of conditions of a certain degree of hypo- and hyperthyroidism, and concludes from clinical observation that the thyroid gland possesses two varieties of internal secretion, the one being of an excitory character, and the other inhibitory. Some of his cases of hyperthyroidism were associated with profuse menorrhagia, others with partial amenorrhea the ovaries may very possibly be normal, and the thyroid or pituitary responsible for the symptoms. He emphasizes the desirability from this point of view, of using combined glandular extracts in the treatment of amenorrhea and other disorders of the genital functions.

The Thyroid Gland and Pregnancy.—Most of the writers on the subject seem to agree that it is quite a common thing for a woman who is suffering from goitre of any kind to say that it increases in size and causes more discomfort during pregnancy. Blair Bell thinks that this increase of thyroid activity, which in his opinion is most marked in the early stages of pregnancy, takes the form of a storage of colloid material in the vesicles of the gland, and that this storage of colloid is probably necessary, owing to the changes in metabolism associated with pregnancy. He thinks that while thyroid activity is most marked during the early stages, that of the pituitary gland and suprarenals is most marked during the latter stages of pregnancy. Mr. James Berry does not agree that enlargement of the thyroid is most marked in the early stages of pregnancy as in his experience enlargement of the gland and dyspnoea usually occurred in the latter months.

As regards excessive thyroid secretion, Blair Bell is of the opinion that it does not affect fertility unless the patient is in an advanced stage of Graves' disease. If pregnancy, which it rarely does, occurs in a case of marked exophthalmic goitre, he recommends the administration of large doses of calcium salts, owing to the tendency to post-partum and ante-partum haemorrhage. While he is unable to say positively whether or no pregnancy is capable of causing exophthalmic goitre, he has certainly met with several cases in which its onset occurred during pregnancy, and has found pituitary extract very useful in such cases.

Louise McIlroy has seen a previously cured goitre recur on the onset of pregnancy. She concludes that the enlargement of the thyroid during menstruation and pregnancy is probably due to the added strain which pregnancy throws on the organism, and the toxins developed by the ovary or the embedding ovum. The thyroid, in an attempt to counteract this state of things, takes on added toxins.

Blair Bell points out that it has sometimes been said that ovulation ceases during pregnancy. If this is so, it may indicate that the insufficiency of ovarian secretion throws a considerable strain on the other organs of internal secretion, such as the thyroid and pituitary glands, and may, therefore, result in hyperplasia of these organs.

PART II.

The Thyroid and the Menopause.—Blair Bell is of the opinion that deficiency of ovarian secretion, except when due to the natural or artificial menopause, may most often be traced to abnormalities in the more

distant endocrinous glands. It is easy to understand that the psychic and nervous symptoms, which are usually associated with the natural menopuase, are due to the loss of the ovarian secretion, which up sets the balance of correlation between the glands of internal secretion, and also to the changes in these glands which occur at this period, notably the thyroid and pituitary. It is a well known fact that intravenous injection of thyroid extract tends to lower blood pressure at the menopause.

In this connection Murray Leslie refers to the hypothesis advanced by Grunbaum and Ehrlich of the possibility of there being some connection between the growth of cancer in women and defective correlation of the internal secretions. Ehrlich assumes that normally certain substances are present in the circulation, derived from the internal secretions, and that these substances may possibly possess the property of stimulating the body cells to resist the cancer cells. If this is so, one would naturally expect the common incidence of cancer in women after the menopause, and its occurrence in earlier adult life might possibly be due to defective correlation of the endocrinous glands. In support of this hypothesis Murray Leslie reports a case of inoperable cancer in a woman of 28, who six months previous had developed amenorrhea, with the appearance of hair on the face and body.

Effect on the Genital System of Removal of Thyroid.—If the endocrinous glandular system is in such intimate relationship as would appear from what has been said, we should naturally expect that on the one hand complete removal of the thyroid would have an influence on the genital system, and that on the other hand that removal of the ovaries would have a corresponding effect upon the thyroid. The results of investigation show that this is the case.

According to Leonard Williams, the thyroid performs the following functions: It presides over the nutrition of the skin and its appendages, and has a powerful influence on general metabolism; especially calcium metabolism. It is concerned in the development and building up of the body, the development and maintenance of the sexual functions, and with the maintenance of the body temperature. It is one of our chief defences against toxic invasion, is essential to the proper working of the nervous system, especially the higher functions of the brain, and reinforces or antagonises the action of the other ductless glands, especially the genital glands.

It is, therefore, not to be wondered at that removal or atrophy of an organ of such universal importance should have a profound effect upon the harmonious correlation of the internal secretions. Blair Bell's experiments showed that after complete removal of the thyroid there is as much muscular atrophy of the uterus as is seen after oophorectomy, both in pregnant and non-pregnant animals. Changes also occur in the suprarenals, and there is increase in secretory activity of the pituitary body.

In women thyroid insufficiency affects the genital functions in proportion to the degree of insufficiency. Marked insufficiency, such as is seen in myxoedema, almost invariably leads to sterility. Excessive thyroid secretion is not infrequently associated with pathological conditions in the pelvis, but in such cases Blair Bell emphasizes the importance of distinguishing between those resulting from genital affections and those which are the cause of genital affections.

Effect of Oophorectomy of the Thyroid.—We therefore see that important changes occur in the genital system as a result of complete

removal of the thyroid, and the investigations, both experimental and clinical, of Blair Bell and others, show that double oophorectomy leads to profound alterations in the thyroid and other endocrinous glands, affording further proof of the close relationship which exists between them and the ovaries.

Blair Bell found that in the rabbit experimental removal of the ovaries resulted in greatly increased functional activity of the thyroid, as shown by the production of colloid material, with which the vesicles of the gland became greatly distended. This newly formed colloid material differs from normal colloid material in that it is basophile and stains blue with haematoxylin, whereas normal colloid is acidophile and stains pink with eosin. Blair Bell says that he cannot account for this particular alteration in reaction and staining, but he suggests the possibility that the colloid produced after oophorectomy may represent a storage secretion, formed to meet the alteration of metabolism. He is of the opinion that the enlargement of the thyroid seen in pregnancy corresponds to a certain extent with that occurring after oophorectomy. He has known more than one case of exophthalmic goitre to commence during pregnancy, and in view of the results of his investigations he thinks it is amply proved that insufficiency or absence of ovarian secretion leads to changes in the thyroid which may in comparatively rare cases result in exophthalmic goitre. Louise McIlroy also says that it is a well known fact that goitre sometimes follows oophorectomy.

In addition to producing changes in the thyroid, oophorectomy seems also to influence the other endocrinous glands. Blach and Hulles report atrophy of the pineal gland in the whole series of cases. In the suprarenals of rabbits and cats Blair Bell found a definite increase in the reticulated portion of the cortex at the expense of the zona fasciculata, together with temporary increase in secretory activity of the anterior lobe of the pituitary gland. His researches lead him to conclude that the changes in the other ductless glands after removal of their number are sometimes compensatory, and represent an attempt to correct the disturbances of general metabolism.

The Importance of Calcium Metabolism in this Connection.—Calcium salts are of great importance in human economy. In early life they are chiefly used for building up the bony skeleton, after puberty they participate to an important extent in the processes of reproduction, and in late adult life they are largely concerned in bringing about the pathological changes associated with senility, due to the retention of calcium salts in the tissues, especially the arteries. The various internal secretions directly influence calcium metabolism in one way or another, some of them, such as those of the suprarenals and the pituitary gland, tending to produce retention of calcium salts in the blood and tissues, and othesr, such as those of the thyroid and ovary, tending to induce excretion of these salts. This fact is the basis of the treatment of hyperthyroidism by pituitary extract, which has been recommended by Blair Bell. This treatment is on the principle that it is a normal function of the suprarenals and pituitary gland to antagonise the action of the ovaries and thyroid, and thus maintain equilibrium in calcium metabolism. Blair Bell has come to the conclusion that the effects on the thyroid and other endocrinous glands after removal of the ovaries are due to the upsetting of the balance of calcium metabolism by the absence of the ovarian secretion. In animals there is marked retention of calcium after oophorectomy, with increased excretion of the phosphorus and nitrogen.

Influence of "Femininity" on the Severity of the Symptoms after Oophorectomy.—In discussing the question of the advisability or otherwise of indiscriminate oophorectomy, Blair Bell explains the great variations in the severity of the reaction of it, and also to the natural menopause, by the degree, in individual cases, of what he describes as "femininity," which he says normally varies within wide limits. In other words, femininity indicates the previous functional activity of the gental system, especially of ovarian secretory activity. He is of the opinion that the severity of the symptoms following oophorectomy and the natural menopause is directly proportionate to that degree of femininity, and thinks that the ignoring of these individual variations accounts for the conflicting opinions expressed by surgeons, some of whom state that it produces little or no disturbance, while others describe severe reactions and distressing nervous and psychic symptoms. He suggests the possibility of estimating the degree of femininity before operation, and thinks that in many cases it would not be difficult to do so. If femininity and ovarian activity were found to be decidedly below the average, it might be possible to assert that little disturbance was likely to result from the operation, but unless this distinction can be made he does not think it right to perform oophorectomy indiscriminately. In the discussion which followed the reading of Blair Bell's paper Dr. Murray Leslie said that he strongly supported the view of the relationship between femininity and the secretory activity of all endocrinous glands.

Importance of all Internal Secretions as a Whole.—Enough has been said to indicate most unmistakably that there is an intimate and most remarkable relationship between all the organs of internal secretion, and that they one and all play an important and essential part in the process of development and reproduction. This is shown above all by the alterations in the thyroid and other ductless glands which follow oophorectomy, and on the other hand by those in the genital organs, especially the atrophy of the uterus, which result from complete removal of the thyroid. Total ablation of either the ovaries or the thyroid results in profound changes in general metabolism. Biedl points out that on the one hand hyperthyroidism leads, as in Graves' disease, to functional changes in the ovaries, and that, on the other hand, primary changes in ovarian activity may secondarily affect the thyroid, and thus influence the development of the symptoms of Graves' disease.

Blair Bell emphasizes the importance of all the endocrinous glands in the development of the genital functions, and points out that, although the genital organs may be perfectly normal morphologically, they fail to become functionally active at puberty unless the whole of the endocrinous system is in perfect correlation and functioning harmoniously as a whole. Development of the genital organs appears to be dependent upon general metabolic condition regulated by the influence of all the endocrinous glands. Blair Bell also points out that what he describes as "femininity" is itself dependent upon the correlation of all the endocrinous organs, and not upon ovarian secretion only. He regards the ovaries as part of a system, "to which most, if not all, the other endocrinous glands belong," and that these latter organs are of us great significance in relation to the reproductive functions as the ovaries themselves. The exact role played by the individual members of this system still remains more or less obscure, and we do not yet know to what extent excessive calcium retention, due to ovarian insufficiency, may be compensated for by thyroid secretion. On removal of the ovaries or their atrophy at the menopause the reproductive functions of the remainder

of the endocrinous system cease, and the harmony of the system is naturally disturbed. In this event it is obvious that the individual must suffer if compensation or readjustment is not speedily and satisfactorily re-established.

If the connection between the ovaries and the other ductless glands is so intimate as is assumed by Blair Bell and others, it would indeed appear advisable to take this correlation into consideration before deciding to perform double oophorectomy, as we should have to consider the effect of the operation, not on the genital system alone, but also on the other ductless glands. Blair Bell says that in future "those who are interested in gynaecology may come to look upon the ductless glands, in that each one of them is absolutely indispensable to the harmony of the genital functions."

MALIGNANT DISEASE OF THE THROAT*

E. M. Dickinson, M.D., Pittsburgh.

An attitude of deepest gloom seems to prevail both with the profession and with the public in regard to malignant disease. A certain degree of pessimism is normal in a matter of such moment and such uniform discouragement to the human race, but it seems within the last few years to have grown almost or quite to a phobia. A certain veteran practitioner and consultant, in commenting on this deplorable attitude of the public and the profession, said to me that it was much more marked now than it was ten years ago, and that the average physician is so convinced of the utter impotence of not only his own efforts, but those of the profession generally, in the control of malignant disease that the appearance of a case automatically exerted a baleful hypnotic influence. It is undoubtedly true that some of us, instead of making a diagnosis and facing the matter with the patient, feeling as we do the hopelessness of the situation, smooth matters over, allay apprehension and invite delay, an invitation all too welcome to the uneasy patient. A period of self-deception is then indulged in by both physician and patient. Precious time is lost and so the ravages of malignant disease increases year by year.

Now I am not able to state of my own knowledge that the attitude of the profession on this important subject is any worse at the present time than usual but, if so, I believe it to be so because of the abortive propaganda that flourished six or seven years ago. Public meetings were held with the laity much in evidence. Funds were solicited, lectures given, and the public and her physician led to believe that great achievements were in the making. The old idea of depending on operation early and often was wrapped in tin-foil, not by direct word, but by planting the expectation that something much better was available. This new something was radium and the laity calmly sat back and waited for malignant disease to vanish in the wake of malaria and smallpox. Then a period of disappointment or partial success and finally the public press announces that radium is a failure. The reading public believe such to be the case, but do not show any haste in returning to surgery in a hopeful frame of mind.

*Reprinted from the Penna. Med. Jour. XXI, 611-615, July, 1918. Read before the Section on Eye, Ear, Nose and Throat Diseases of the Medical Society of the State of Pennsylvania, Pittsburgh Session, Sept. 27, 1917.

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During the past two years I have seen forty-six cases of malignant disease of which only eight were operable, and some of these perhaps not properly so. A good many of these forty-six had been under their physician's care for weeks or months and had been treated for simple or specific ulcerations or swellings. A considerable number had not consulted a physician until driven by pain, or stench, or hemorrhage.

CASE 1.—Mrs. H. presented herself for diagnosis, having a large swelling on the left side of the neck below the angle of the jaw; her left eye protruded and was displaced outwardly; the nose was completely obstructed. She complained of dysphagia and pain in face and head. She complained of dysphagia and pain in face and head. Her first symptom, nasal obstruction, was noticed five weeks before. For this she had a turbinotomy performed by a local physician, but experienced relief for only a short time. She returned to him and he operated a second time. From the second operation she received no relief and within a few days she noted failure of vision and protrusion of the eye; pain developed and became very distressing. The swelling in the neck appeared two weeks before her visit to me and had increased with amazing rapidity. A frozen section of a piece of tissue from the nose confirmed the suspicion that the growth was carcinoma. Death ensued in a few weeks.

An interesting contrast to Case 1 is the following:

CASE 2.—J. J. R., aged 45, was referred to me at the Mercy Hospital by Dr. J. J. Buchanan. The patient had noticed a swelling in the left pharynx four and one-half months before but had not consulted a physician, though suspecting the condition to be cancer. He finally came because of dysphagia and pain in throat and ear. His breath was very offensive. His left tonsil and pharynx were the seat of a large sloughing carcinomatous mass. The glands of the neck on the affected side were enlarged and hard.

I concurred in the opinion that the case was inoperable and referred him to Dr. R. H. Boggs for radium treatment, thinking it might relieve pain and dysphagia. Dr. Boggs accepted the case with the same idea. After a few weeks of the treatment I noticed a marked reduction in the size of the growth, the fetid odor was gone and the pain and dysphagia had disappeared. He was gaining in weight and said he was going to get well. Dr. Boggs began the use of the Coolidge tube in conjunction with radium, with the remarkable result of a healed throat, disappearance of the enlarged glands. The patient resumed his vocation and when last seen, two years after the beginning of his treatment, had had no recurrence.

CASE 3.—Mrs. C. H., aged 66, complained in July, 1910, of a persistent hoarseness and occasional pain in the larynx. She had received local and medical treatment for some weeks without improvement. Examination revealed a small sessile growth on the left vocal cord. This was removed July 15 by the endolaryngeal route. The wound healed nicely and the hoarseness disappeared. The pathological report showed it to be a squamous celled cancer, and her physician, Dr. Snyder, and I advised a course of Coolidge tube treatment and arranged with the patient that at the first sign of recurrence she was to return for a thyrotomy, assuring her that by an early operation sufficient tissue could be saved to preserve a practical voice. She underwent a short course of treatment with Dr. R. H. Boggs, and progressed favorably until September, when she went to a sanitarium in Michigan for treatment of her nerves and stomach. Independent of us she also had an examination and

treatment of her larynx. The physician is said to have advised her that her larynx was normal, that she had no cancer, that in his opinion she never had had one, and that she should go home and forget it. She came home but her hoarseness returned and she could not forget it. I saw her in October, diagnosed an early recurrence and in accordance with our original plan tried to induce her to go direct to the hospital for a thyrotomy. She urged her doubt as to the correctness of the diagnosis and refused. On November 26 she returned to me complaining of severe dyspnea and dysphagia. The larynx was practically occluded by carcinomatous mass involving the whole left side and right arytenoid. The glands along the trachea were not palpable. I did a tracheotomy and later proposed to do a laryngotomy. This was refused on the ground that probably the sanatorium doctor was right, and because we could not promise her a voice. She returned home and died some weeks later, a sacrifice, I believe, to flippant advice, based on a perfunctory examination and made authoritative by august surroundings.

CASE 4.—On June 16, 1916, Mr. A. D., aged 67, was referred to me by Dr. R. H. Boggs for operation. He had been under treatment by means of radium and roentgen ray for some time and had made some progress, but of late had ceased to respond satisfactorily. Examination revealed an infiltrating ulcerated mass in the left side of the throat, involving the tonsil, side of the tongue, and the mandible at the site of the third molar. An operation was done on June 19, removing the tonsil and pillars, a portion of the mandible and a portion of the tongue. The operation was followed by further treatment by Dr. Boggs. The pathological diagnosis was squamous carcinoma. The patient is alive and well.

I have recited these few cases as illustrative of professional and lay practice and attitude, and to a certain degree of the value of the different methods of treatment.

The value of surgical treatment is well known and needs no defense. To increase its value many times over it is only necessary to speed up the average date of diagnosis two months. A localized process in a fairly favorable location is generally amenable to surgery alone.

The same is true also of the chief nonsurgical treatment, viz., radium, and the Coolidge tube, for both of which I entertain the highest regard, especially when employed as an adjunct to surgical treatment, though as I have shown they are sometimes able to carry off the palm alone. The hysterical attitude with which radium has been introduced is most regrettable but unavoidable. The lure of its intrinsic value, wonderful physical behavior and proposed uses made it the certain spoils of the feature writer and the professional faddist, coming and going. Radium fills a large niche in therapeutics and in my opinion it will ultimately fill a much larger.

What we need now is not new lines of treatment but a little better use of what we have. To use better what we have we must begin early. And to begin early we must get the public and the family physician to take a hopeful interest in malignant disease. A great deal more is known about it now than five years ago. Some wonderful cures have been made and the solution of the mysterious phenomena of malignant disease will finally be found, through the accumulated knowledge gained by handling a great many cases from incipiency to death or cure. If we wish to hasten this solution each and every physician should initiate a campaign of education among his patients, holding to the hopeful side and encouraging prompt examination of all abnormalities, and in the role of examiner his sense of responsibility should be most keen, since life is at stake.

Discussion. Dr. Chevalier Jackson, Philadelphia—Case 2, regarded as inoperable by Dr. Buchanan, coincides with my experience. When we find a lesion in that region that has spread to all the deeper tissues of the neck and all the lymphatics are involved, my experience is that an esophagoscopy will show that there is an involvement of the mediastinal lymphatics, which, of course, cannot be removed The fact that the case was cured afterward by the roentgen ray and radium is a very remarkable thing, and corroborates what has happened in quite a number of cases. It remains to be determined which cases will be cured by radium and the roentgen ray, and those that are not amenable. Personally, it has seemed to me that in the cases that I have seen of my own and in consultation with others, the cases in which radium everted its best effects are in patients not too old and feeble. For its best effect it seems to require some resistance on the part of the patient. The old feeble, cachectic patient will average a very low percentage of cures. That may be proven or disproven by wider experience. The trouble has been that it has been in only comparatively recent years that anybody has had radium enough to do more than irritate the growth.

Case 3 is such an old story in the experience of all of us that it makes me very much discouraged with the whole subject of malignant disease. When Dr. Dickinson had removed the growth and got the patient clear of all symptoms, he knew the danger of recurrence. He prepared to do a thyrotomy, which in that kind of a case would yield a cure in 85 per cent. of the cases of growths in that location at that stage; but the patient hunted for someone who would tell him the growth is not malignant. There remain a few practitioners, who, when a malignant case gets well, doubt the diagnosis. It was the same years ago with tuberculosis. When the profession had the idea of "consumption," a cured case of pulmonary tuberculosis was told: "You never had any consumption."

Case 4 struck me as being exceedingly interesting. It was not doing well under the radium alone. It did well under the radium and the ray after the surgery. It points clearly to the fact that we have much to learn about radium and its effects. Some day after we have available statistics on tens of thousands of cases we will be able to determine why it is that in some cases surgery will be followed by prompt recurrence and be cured by radium, and in other cases radium will have no effect, but we have abundant evidence that radium has some deterrent effect in preventing a recurrence after surgical removal.

In regard to early diagnosis, that is a very important thing. Every surgeon in speaking on the surgery of malignant disease urges that the diagnosis be made early; but nevertheless, the man past middle life is treated for hoarseness under a diagnosis of chronic laryngitis for a year or two, and then he comes in with a hopeless sloughing, ulcerating lesion, glandular involvement, pain and cachexia, in other words, the diagnosis is made when there is no good in making it.

If the profession would only take to heart such papers as that of Dr. Dickinson and have the larynx examined immediately, when a man in middle life gets hoarse, a large percentage of laryngeal cancers could be cured. Prescribing for laryngitis without looking at the larynx is a great wrong. There are two methods of treatment that were not referred to in the paper, namely, diathermy and fulguration. I have seen some cases with relative cures, by Dr. William L. Clark of Philadelphia, and there are recorded a number of cases treated by Mr. Douglas Har-

mer of London, England. Cooking the tissues by fulguration has been followed with good effect, but as between operation, radium, fulguration or diathermy, I think statistics will in the future map out a field for each.

In conclusion, I should like to refer the pessimist on cancer to the last number of the *Saturday Evening Post*. Professor Keen reports the operation, for malignancy, on Grover Cleveland, who survived for fifteen years and then did not die of cancer.

Dr. R. H. Boggs, Pittsburgh: Dr. Dickinson is very modest. He had a case ten years ago of sarcoma of the tonsil that he removed, and which I treated afterward. This patient is well and alive today.

Just one word in regard to the case that I referred to Dr. Dickinson; probably that will answer Dr. Jackson's remark. When this patient came to me, he had been refused operation. The growth was growing very rapidly; the glands were involved, as Dr. Dickinson stated. He was treated with radium inside the throat, and I gave him almost a caustic dose, more radium than one would ordinarily give, unless one expected to have the remaining portion of the growth removed surgically. When he was referred to Dr. Dickinson, the tissue was undergoing a degeneration. The type of carcinoma had been changed by radium, as well as being reduced in size. Before radium treatment the carcinoma was growing rapidly like a medullary type, and after treatment it appeared to be less malignant, like a scirrhous cancer.

Now what will take place in those glands? It is well known that the smaller the lymphatic glands and lymphatic vessels are, the more they oppose cancer dissemination. Radiotherapy is followed by a sclerosis of the lymphatic vessels which always checks metastases. In a case like this, an operation can be more safely performed if the malignant growth is checked and reduced in size, and the lymphatics partially blocked. Dr. Arthur Holding, last year at the American Roentgen Ray Society, pointed this out with a great deal of emphasis, he removed tissue after treatment which showed that a few cancer cells remained in some cases. If the lesion heals and a few cancer cells remain, we only have an apparent or clinical cure.

REVIEWS AND ABSTRACTS

Frank A. Pemberton, M. D. (Boston). Hemorrhage from the Uterus in the Non-Pregnant Woman. Boston Med. and Surg. Jour. CLXXVIII, 485-492, Apr. 11, 1918. Regarding the use of radium and the x-rays, the author says:

"Dilatation and curettage finds its greatest value in diagnosis. It is used as a cure when the cause is in the cervix or endometrium and not malignant, polyps, submucous fibroids, retained products. It removes the polypoid gland hypertrophy, but that may recur. Some of the young girls, with uterine insufficiency, get well if they are curetted at each catamenia for several successive months. This is more dangerous, however, than the x-ray or radium."

"Abdominal operation is called on for the many cases found in the abdomen and for malignant conditions. It seems hardly necessary to go into details. It should be remembered that with a simple retroversion and prolapse, a suspension may not effect a cure of the bleeding,

either because the bleeding is due to a hypersecretion of the ovary instead of the retroversion, or the uterus does not regain its tone."

"The two methods of treatment which render satisfactory the treatment of the uterine insufficiency cases, both in young and old, are radium and x-ray. They both act in the same way, that is, by killing the follicles in the ovaries, and thereby stopping the internal secretion. They are more effective on ripe and ripening follicles than on the primordial ones, and, therefore, it is harder to cause amenorrhea because all of the follicles must be destroyed to obtain it. They are supposed to have a direct action on the uterus, and also on fibroids, for the treatment of which they are frequently used. There is an increase of connective tissue in the uterus and fibroids; it is said that the treatment causes an obliterating endarteritis, and fibroids decrease in size. This last effect, however, may be comparable to the shrinkage occurring often at the menopause, and be due to action on the ovaries rather than to direct action on the tumor."

"The two methods differ in that the radium is much more powerful, much more effective than x-ray. X-ray can be given in two ways, large or small doses as the urgency of the case requires, but even with large doses it takes many more treatments to attain the desired effect than with radium. X-ray requires large doses for from 9 to 18 weeks to produce amenorrhea, while one treatment of radium will do it. The reason for it is, of course, that if x-ray treatment were continued for many hours at a time—long enough to produce amenorrhea—burns of the skin would result, and also it is decidedly uncomfortable to be in one position for as long a time as x-ray would require. Whereas radium can be placed in the uterus and the patient simply stay in bed for the required length of time. X-ray treatment is also much more expensive than radium on account of the apparatus used."

"We have had more experience with radium because we are lucky enough to have some and it is easy to use. For the young girl with uterine insufficiency, we put 50 mg. of radium in the uterus because that gets it nearer the ovaries than any other place except the rectum—to which, however, radium seems to be very irritating—and leave it from 4 to 12 hours, depending on how much effect we wish to get. It is, of course, better to leave it too short a time rather than too long because the latter is not so effective in women up to the age of thirty-five as it is later in life. Formerly many of these cases came to hysterectomy, which can now be avoided."

"If amenorrhea is caused by radium it has not been established whether it is permanent or not. We do know that, in young women, if small doses are used, it will cause amenorrhea for several months only, but whether large doses will cause it permanently only time will tell. X-ray in large doses causes amenorrhea in young women for several months to a year, but rarely causes a permanent amenorrhea unless the treatment is continued. In older women, of forty and over, it gets its effect much quicker and it is probably more permanent.

"Both are very valuable in decreasing bleeding in fibroids in those patients who require operation, but who are poor surgical risks on account of having a secondary anemia due to their long-continued profuse menorrhagia. The bleeding can be decreased or stopped, giving the patient a chance to regain strength before being operated on."

"Radium is especially valuable in stopping the bleeding from inoperable cancer of the cervix. Here it acts locally to a marked degree. In most cases the ulcerated cervix cleans up and presents a smooth sur-

face like scar tissue, ridding the patients of the bleeding and discharge and relieving them immensely, after two or three treatments at intervals of about a month. The change externally is almost miraculous but, of course, the disease continues in the broad ligaments and glands. Occasionally it seems to stimulate the tumor, hastening its growth and the death of the patient."

"You have to be careful in using it, however, because vesico-vaginal and recto-vaginal fistulæ are very likely to follow if too strong a dose is used where the vaginal wall is deeply invaded."

"X-ray will also stop this bleeding, but it is harder to apply and the treatment takes a much longer time."

* * * * *

J. C. Vaughan, Lt. Col, I. M. S., (Civil Surgeon, Ranchi, India). Notes on Cases Treated with Radium. Indian Medical Gazette, LIII, 333-336, Sept. 1918.

"The therapeutic uses of radium have of late aroused a wider interest, and the following few cases which are among the earliest if not the first published in India have, I trust, some interest."

"The radium apparatus I have employed has consisted of two Dominici platinum tubes—each containing 5 mg. of pure radium sulphate. The walls of these tubes are 0.5 mm. in thickness—my total amount of radium has therefore been only 10 mg."

"CASE No. 1.—Papillomatous growth on dorsal aspect of sulcus above glans penis. This was twice removed in the previous 9 months. Excised for the third time and immediately after two radium tubes placed in the wound for 25 minutes without further screening. Application repeated on the two following days; no return of growth observed; patient last seen fifteen months later without any return of growth."

"CASE No. 2.—A European lady, aged about 23; an adenoma in breast prior to marriage; removal refused. After marriage growth became uncomfortable; first shown to me when about 7½ months advanced in pregnancy. Growth then a little tender, rather bigger than the body of a large tea-spoon; later on breast inflamed and suppurated and had to be incised. This opportunity taken to bury two radium tubes into mass of the growth for 72 hours continuously. A few days after patient left for Home with instructions to have breast amputated on arrival Home, as she had declined any operation in India. On arrival Home surgeons declined operation as there was no tumor to operate for, patient seen here 10 months after—no growth to be found."

"CASE No. 3.—European lady upset a pot of tea onto her knees; result—very extensive keloids in branching lines about 11 inches long over total length on one leg just above knee, and about 7 inches long on the other leg. Keloid growth very painful, so much so that she could not keep standing up for her ordinary occupations without great pain. Treated with radium application of two tubes for from 8 to 12 hours continuously over each part that could be covered by the tubes. The entire keloid was thus treated in sections as it were, the tubes shifted after each 12 hours or so from one spot to another till the whole area had been radiated again and again. This keloid has now become reduced to a soft scar which is not at all painful and the patient can walk, ride, stand, etc., without any pain or discomfort. There were in this case a good many interruptions in the treatment which was continued for a week to ten days at a time over a few months in all."

"Case No. 4.—An enormous keloid growth of the face, ear, and chest. This was the first keloid I treated, and following Wickham and Degrais, I at first used rather limited radiation; progress was very slow till I adopted 7-hour and 9-hour applications. The results are shown in the illustrations."

"The photo, I showed to Dr. Morson in 1914 at the Middlesex Hospital, and in this case the curious point was that the vaccination scars on the arms had taken on keloid enlargement, although they had not been involved in the scald in the scars of which the keloid had grown on the face, ear and chest. Then later, when treated, the application of radium to the chest was followed by disappearance of the keloid growth in the vaccination scars; and application of radium to the left side of the face was followed by a partial subsidence of the keloid on the right side of the face."

"Case No. 5.—On the 18th of September, 1917, an old woman, aged 50, was admitted to the hospital with a huge fungating cancer of the left breast measuring some five to six inches across, foul smelling, abundantly fly blown, crawling with maggots. She has besides a large secondary growth in the left axilla as big as a good-sized peach and obviously, too, there was abundant glandular infection, for the arm and forearm and hand and fingers were all markedly swollen and œdematous, obviously from interference with the venous circulation. She was in very poor general health. The cancerous ulcer on the breast was cleaned out with boracic lotion and boracic acid fomentations and turpentine, and on the 21st of September the two radium tubes were buried in the mass of the growth. Their position was changed every 72 hours, but radiation was practically continuously maintained. The first photograph was taken on the 25th of October, 1917. Her general condition was so bad at the first and the case seemed so absolutely hopeless that my Assistant Surgeon actually omitted to carry out my instructions to photograph the case at the very start because, as he said, he thought she would be dead in a week's time. He now regrets he did not take the earlier photograph, as the size of the growth in the breast had become considerably reduced when the photo of the 25th of October was taken. The photo of the 25th of October, 1917, shows the radium tubes in position. The photo of 19th November shows the growth much reduced, and at this time the fœtor had quite gone and the arm-swelling was much reduced. A photo taken on the 20th of December, 1917, shows the normal wrinkles on the skin and the growth reduced to a nodule on a level with and to the left of the nipple and of about the size of the nipple itself, while in the picture of the 2nd of January, 1918, this nodule is reduced to a small fibrous button and the whole of the huge fungating cancer is reduced to an ulcer about one-quarter of an inch across and the breast is soft throughout and the arm-swelling practically all gone. At this stage the patient left the hospital against advice. In this case radium was never applied anywhere but in the growth aorund the nipple—never to the growth in the axilla which completely subsided and was in no degree to be felt."

"Case No. 6.—An aboriginal male, aged 45, was admitted to the hospital on the 23rd of January, 1918, for a malignant growth involving the parotid region of the right side and the whole of the right side of the neck—with a considerable extent of growth in the left side of the neck also—*vide* photographs. This case is such a remarkable one that I give an abstract of the description of the growht as entered by Assistant

Surgeon Bimal Kumar Roy, and it is a very correct description of growth on the right side."

"A case of malignant growth involving the parotid gland of the right side and the surrounding positions of the neck inoperable."

"The patient, an Uraon male, aged 45, was admitted on the 23rd of January, 1918; he comes from a very healthy stock, and has not himself suffered from any serious illness, except the present illness which dates back to about 8 months ago, when the patient began to feel weak and debilitated. About four months back he noticed some swelling on the right side of his neck which rapidly increased in size and assumed its present serious proportions."

"The tumor is of an irregular shape—the size of a man's fist—extending from below the ear to the nape of the neck where the margins cannot be defined; behind it extends to about an inch and a half of the cervical vertebræ. The whole border of the tumor in this situation is limited by the trapezium muscle and can be more or less clearly defined. Forwards the tumor extends over the angle of the jaw in a more or less diffuse manner. The sterno-mastoid muscle has become wholly incorporated within the tumor mass especially in the lower portion, only its two ends of insertion being distinguishable. The tumor is hard and elastic to the touch and at its lower portions behind, it breaks up into several swellings which are, however, continuous with the parent tumor. The skin is apparently still free, and a few dilated veins can be seen coursing over the tumor. The sub-maxillary and sub-mental glands are affected and are swollen as also some supraclavicular glands. During the growth of the tumor the patient experienced same dyspnœa, the voice changed and became a little husky, deglutition became a little difficult, and the senses of smell and the hearing were to some extent impaired. There is a constant heavy aching pain in the head, and a certain degree of anorexia has been present for the last three weeks. The patient himself says he has lost much weight during the last four months."

"Radium 5 mg. in each of two tubes was first buried in the growth on the 27th of January with the aid of a trocar and canula. They were kept in for 72 hours continuously, after which they were re-applied in other parts of the growth. During this time there was not much change in the appearance of the tumor. Only some inflammation round the punctures and the margins of tumor seemed rather less defined. After the expiration of the second 72 hours, when the tubes were again taken out on the 2nd of February, the changes brought about in the tumor were simply marvellous. There was only a slight swelling left of all that had been such a big tumor—the partially separate parts of the tumor have as it were melted away as also the glandular infiltration. It is no longer possible to take any measurements of the tumor, for there is hardly any tumor left so to speak, and now, after another application of 24 hours, while I am writing these notes, there is hardly anything in the site of the tumor except perhaps a certain fulness in that region of the neck, where once there was such a large growth. The skin about the surrounding region is wrinkled, otherwise there are no changes."

"By the 23rd of February, one month after first commencing treatment, the entire growth on both sides of the neck had disappeared and nothing was left to feel or see but a small fibrous nodule in the posterior triangle of the neck of the right side, and this is now being further treated. The growth on the left side began to subside about ten days after treatment on the right side was begun, and was considerably reduced when it was also radiated directly, *but the sub-mental and sub-*

maxillary glands and the glands in the lower part of the neck in the right side have disappeared without direct treatment—all but the one nodule now under treatment. Another most remarkable feature is that the voice has become natural; the disturbances in the senses of smell, hearing and taste have all disappeared and the head pains have also ceased. These latter symptoms—the neuralgia and the disturbances of special sensations—we did not know of nor suspect at first until the patient himself told us of them, and he volunteered this information without leading questions and entirely of himself; and he told us of them when his case was being noted and before the treatment was begun. The whole case is a very remarkable one, and I trust I shall be able to follow it up as the patient is a Christian aboriginal and we can always find him."

"One other point—the relation of radium to surgery. There is nothing yet on which we can conclude that in tumor cases radium can take the place of surgery. It cannot; but it can help surgery by making inoperable growths operable. And there is more. All of us know "simple adenoma" which when removed has recurred, and the sequel we all know in too many cases. Case No. 2 was obviously a "simple adenoma" which was just becoming very dangerous when the breast suppurated and the growth was treated with radium—it has vanished and has not recurred for ten months—and there is not a sign of it. Not a conclusive argument it is true, but nevertheless here is food for thought—would it not always be best in such 'simple' cases to excise early and *always to treat with radium at the same time?* If this were always done how many recurrences might be prevented? Such a question can only be solved by further experience with radium. But if radium cannot replace surgery, we are bound to concede it its own high place and acknowledge that it can relieve and cure in cases where the surgeon is powerless and there is no surgery that can accomplish what radium can. It is not a question of antagonism or comparison between the two. Each has its sphere; and they can work together. There are cases where the surgeon must take the lead and radium should only *follow* the knife, but there are also cases where radium must lead and the surgeon's work must follow later; and there are others again, numerous enough unfortunately, where the only relief obtainable, even though it may not always be a cure, is from radium, but among these cases radium holds a good record and is undoubtedly improving it, and daily advancing to the acknowledged position which it is bound eventually to win and to maintain."

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L. A. Oliva. X-Ray and Radium in the Treatment of Uterine Fibromyoma. Gazz. d. osp. e d. clin. (Milan), 345, 1918. Abstracted in International Abstract of Surgery, Surg. Gynec. and Obst., XXVII., 338, Oct. 1918.

"The author has treated 35 cases, most of them at about the menopause, in which the tumor was not very large. In 25 there has been a total disappearance of the tumor, but only in 10 cases have two or more years passed since the last irradiation. Of the remaining 10 cases, 6 show an average reduction to about one-third the original size of the tumor, with persistent amenorrhœa but no reduction in the size of the tumor. Five of the cases were treated exclusively by roentgen rays with deep massive

doses; 28 were treated with roentgen rays and radium; 2 by radium alone."

"The author thinks irradiation should be the treatment of interstitial and intraligamentous fibromyoma of small volume in women who have passed the menopause or are approaching it. This treatment generally causes the tumor to disappear with persistent amenorrhœa. With the same type of tumor in young women, irradiation is not to be counseled because the massive doses necessary endanger the maternal function, while surgery often permits a simple enucleation of the myoma with preservation of the organs."

"With subserous fibromyoma, especially if large, no matter what the age of the patient, surgical treatment is to be preferred because the action of the rays is very slow, hazardous to maternity in young women, and this kind of tumor, owing to its volume and compression exerted, calls for quick removal. Similarly submucous fibromyma more or less prolapsed, no matter what the age, if complicated by other diseases calls for surgical treatment. Operation is usually easy, effective, and without danger."

"Irradiation is indicated where surgery is contra-indicated on account of cardiopathy, nephritis, anæmia, etc. Six of the author's cases were of this type, and he remarks that anæmic patients tolerate irradiation very well if it is rapid and intensive. Finally, irradiation is effective in cases in which operation must be for any reason delayed, for instance, for a very large tumor or for the lesser anæmias. The hæmostatic and atrophying action of the rays in such cases is of the greatest benefit inasmuch as it permits rehabilitation of the patient's general state, reduces the tumor, and warrants a more favorable termination to surgical operation."

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R. Fukuda. Treatment by Radium Ray. Bull. of Naval Med. Assn. of Japan, No. 19, p. 1, June, 1918. Abstracted in Jour. A. M. A., p. 603, Aug. 17, 1918.

"Fukuda has treated thirty-one cases of cancer, sarcoma, lupus, anal fissure, exophthalmic goiter, tubercular lymphadenitis, nevus and angioma by radium ray in the Tokyo Charity Hospital. The effect on cancer was extremely good if adequate attention was paid to applying sufficient radiation measured by the quantity of radium and the duration of exposure. In cases of cancer of the esophagus, a relatively small quantity was sufficient to relieve patients from pain and contraction caused by the tumor; but not for its permanent cure. The effect on sarcoma was also good. Its effect on anal fissure, without any signs of relapse was noteworthy. The effect on lupus was uncertain, some patients being permanently cured without relapse, and some not being affected at all. The effect on tubercular lymphadenitis was undoubtedly good. It had some good effect on the thyroid of exophthalmic goiter patients. In some cases two or three applications resulted in the rapid reduction of the enlarged thyroid with an improvement of the general signs. The cosmetic effect on angioma and nevus was certain. Its effect on nocturnal incontinence seemed to be certainly good; multiple condyloma acuminata were more beneficially affected than by any other treatment; the scar was softened and the chronic inflammatory infiltration was dispersed by this treatment. Local burns were sometimes caused by this treatment, even through a suitable filter. These burns, however, healed quite easily by themselves and there was no need to pay much attention to them."

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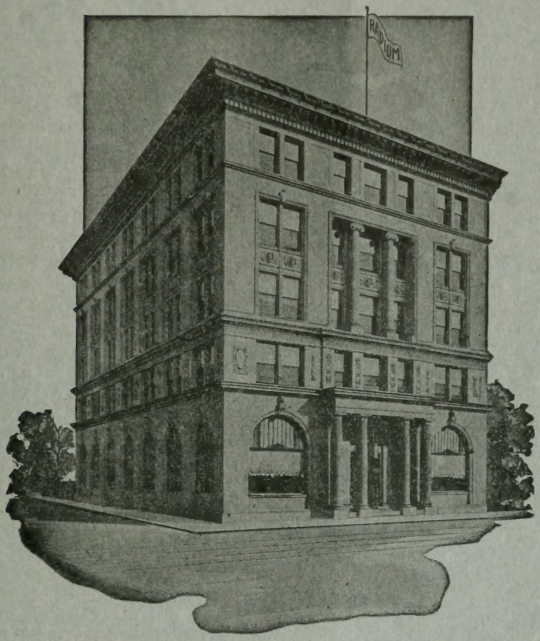

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